MANUFACTURING BUSINESS PLAN

SMALL BUSINESS MANAGEMENT SYSTEMS

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Preface

The purpose of this Enterprise Manitoba publication is to provide some guidance to Manitobans who are planning to start a manufacturing enterprise or who want to re-assess the viability of an existing operation. The help offered is in the form of a Business Plan, or a simplified blue-print for action.

It would be impossible to cover all aspects of manufacturing in a handbook of this scope. This publication is therefore aimed at the small manufacturer and will be limited to the provision of basic advice only. There are a number of other Enterprise Manitoba publications in this series which provide guidance for other aspects of a small business. Included are "Small Business Finance Plan", "Marketing" and "Human Resource Management".

Planning is the very foundation of a successful business because it illuminates the future, helping the entrepreneur not only to avoid pitfalls and problems but also to take advantage of opportunities. Thorough planning also gives investors, lenders, suppliers and employees assurance of a solid approach to the conduct of the enterprise.

It is important that you are honest with yourself as you work through the planning process. Do not overlook anything, and assess your resources, abilities and finances properly. Examine every facet of your proposed business to make sure that each aspect is given careful consideration. Keep in mind, too, that you will be competing with others at every turn —— for employees, finances, customers and suppliers. Try to assess possibilities realistically. On the whole, be candid, comprehensive, complete and competitive.

The Business Plan

A Business Plan is a way of answering the question. "Where will my business be this time next year? Three years from now?

For a comtemplated or new business, a Business Plan can help determine what resources will be needed to ensure its success. It follows then that if the required resources are not available, it would probably be unwise to launch the enterprise in the form in which it is now conceived.

For a struggling existing business, a Business Plan can help measure the true condition of the business and reveal its weaknesses and strengths.

For the successful, established business, a Business Plan is equally necessary as a "track to run on" and a source of business information.

A Business Plan is based on assumptions, estimates and forecasts. Therefore, the Business plan is a guide, a reminder and, to an important degree, a source of challenge.

The Business Plan proposed here has four main sections:

- Market Feasibility (Sales)
- Manufacturing (Costs)
- Financial Costs
- Profitability

Each section provides a step-by-step method for developing your projections. Essential ingredients are identified and examples are shown. For purposes of the examples in this book, references are made to the manufacture of various products. The principles followed apply, with some modification, to any or all manufacturing establishments.

Once you have completed your Plan, using the techniques suggested here and following the guidesheets, you will have a systemically-prepared, extensive document from which each of the "stakeholders" in your business can make an objective assessment of its future prospects.

The "stakeholders" include:

You — as the person who stands to lose the most if the business falters. To obtain a clear picture of your personal financial needs, complete the "Assessment of Personal Finances" on page 4.

Financial Backers (including silent partners) — most businesses need financial support from outside (friends, relatives, entrepreneurs, bankers, etc.) and these lenders and investors seek assurance of the safety of their investments.

Sources of Help — it is often necessary to turn to others for help in achieving your goals. Complete the self-analysis test on page 5. This will help you recognize where your own knowledge and skills should be supplemented by input from professionals and specialists such as lawyers, accountants, insurance agents, advertising agencies, suppliers and educators. Some may help you in the preparation of your Business Plan; all will be more effective if they can see that you have put a lot of thought into your Plan.

Table A
ASSESSMENT OF PERSONAL FINANCES

Financial — How much money can I put into the business and how little will I require during the first year?

My Financial Obligations (per month)	Amount Per Month
House Mortgage/Rent	
Family Food Bill	
Utility Bills	
Charge Account Spending (yourself and others)	
Operating Costs for Car(s)	
Personal Spending/Recreation	
Repairs to House	
Major Purchases (car, appliances, furniture, etc.)	
Other Expenses	
Insurance (life, car, house)	
Medical/Dental	
Car Repairs	
Education (family)	
Taxes (property)	
Retirement Savings	
Seasonal Spending (e.g. Christmas)	
Other Expenses	
TOTAL	

	Amount Per Month
My needs per month are	
Other Income per month is	
Will my business be able to meet such expense?	
If not, should I withhold some of the money I expected to invest?	
Amount I expected to invest	
Amount I am now withholding	
New amount I expect to invest	
TOTAL	

Table B
PERSONAL SKILL AND KNOWLEDGE (Self-Analysis)

Check (√)	Need Help	O.K.
Financing		
I know how to analyze options.		
I understand financial jargon.		
I know how to control expenses.		
Marketing		
I am "customer-oriented"		
I am skilled in selling my product/service.		
Media advertising		
Display and signs		
Premises layout		

Check (√)	Need Help	O.K.
Staffing		
I know the number of employees I need and the qualifications they must have.		
I am familiar with hiring practices and interviewing.		
I believe I can motivate my employees to high levels of productivity.		
Buying		
I am trained and skilled in buying what customers want.		
I have good supplier contacts.		
I am aware of seasonal requirements.		
Accounting		
I know which records to keep and what information they should contain.		
I know how to interpret financial statements.		

Market Feasibility

The key to your success will be your ability to produce an item which the customer wants at a price he is willing to pay. Before you take any steps to begin manufacturing your product, you have to be certain that there is a market for it.

Some of the questions you need to answer in this regard include:

- who is your customer?
- where is your market?
- why will your product be bought?
- at what stage of development is the market?
- are there seasonal aspects to your market?
- what will your market share be?

Because this is such an important topic, another volume in Enterprise Manitoba's series, "Marketing", provides a more detailed examination of marketing. A brief overview is contained here, in the context of estimating the sales of your product.

THE PRODUCT

Critical to your success is, of course, the development of your product. You cannot venture into the market with a product which is either of low quality or too high priced. Before you begin manufacturing, you should have constructed a proto-type of your finished product, and perhaps have demonstrated its ability to selected potential customers. Feedback from customers can enable you to refine your product to suit their needs.

The guideline to product development and in fact to your entire marketing plan is your customer. Product development should be defined by the needs and ability to pay of the customer. Similarly, advertising, pricing, and distribution decisions will be guided by the customer. A business which ignores the needs, ability to pay and characteristics of its target market will not survive very long.

There are other decisions to be made as well. They are concerned with the characteristics of the product offered, including its quality, types (work/play/fashion), and sizes/colours/models.

You may be able to identify an opportunity but not have the resources or capability to take advantage of that opportunity. It is senseless to attempt to sell products for which there is no market and similarly as senseless to attempt to tackle a market and product which you lack the capability to handle. Once you have identified the product to be manufactured the next step is to determine if there is a market for it.

TOTAL MARKET

The next step in assessing the demand for a product is to make an estimate of the total potential market for that product. In some cases, the product is already being sold, and you might be able to obtain data on its total sales. If the product is new to the marketplace, then perhaps only an estimate can be made.

In making projections about future sales of any product, you might consider:

(a) any trends or outside influences which might either create or destroy an opportunity. Such trends would include changes in the makeup of population, new government regulations, advances in technology, and changing economic forces (oil prices, interest rates);

(b) the economic, political, and cultural features of any international market which you might enter;

(c) the current and potential future actions of any competitors. You should monitor the products provided by the competition, in order to (a) keep abreast of new developments, and (b) to identify any shortcomings which might provide you with an opportunity.

There are many other marketing questions which need to be answered by the budding enterprise:

(a) on which market segment (industrial, consumer, government, wholesale) will you concentrate your efforts?

(b) what proportion of the total market can you realistically hope to obtain?

(c) who currently purchases products of this sort? where do they purchase them? at what time of year?

(d) how will you distribute the product? have you considered marketing the product door to door? by mail? through established retail outlets? through your own retail store?

These and other questions are discussed in the afore mentioned Enterprise Manitoba publication, 'Marketing'. You should obtain a copy of that handbook from your nearest Enterprise Development Centre.

Manufacturing

A major element in your planning process will be concerned with the actual manufacturing aspects of your business. Those aspects will include equipment and fixturing requirements, plant layout, the production system, direct and indirect costs of manufacture, and inventory control.

An examination of these areas should yield information about the costs involved — of the equipment, the building, the raw materials, and so on. That cost information can be combined with the sales estimates derived to provide an assessment of the potential profitability of the business.

In compiling the cost information, reference will be made to the Cost Estimate Guide Sheet, a blank copy of which is included in Appendix 1. You will be able to use this guide sheet to collect information about the costs of manufacture for your business.

EQUIPMENT

The first step you might take is to examine in detail the process required to manufacture your product and to itemize what equipment will be needed. It is important, of course, to carefully evaluate the alternative types of machines that you could use in your process. Assess the machines in terms of their costs, production capabilities, servicability, and delivery times. In estimating the costs, be sure to include taxes, freight, and installation. You must be certain that the machine under consideration is capable of performing the task required. There is no sense, however, in overbuying. If a shovel will do the job, don't buy a bulldozer. Remember too that you may be able to keep costs down by purchasing used equipment.

Different manufacturing operations require different fixtures in their premises. In your list of equipment, include all fixtures that you will have to purchase as ancillary equipment in order to properly equip your premises. You may, for instance, need special drainage or ventilation systems. Any such alterations, in the way of fixtures, should be included in your list of equipment.

When you have compiled your equipment list, complete with costs and suppliers, you will be able to complete Item 7 (Investment Capital Required) on the Cost Estimate Guide Sheet.

Table C —
PLANT LAYOUT

	PROCESS LAYOUT	PRODUCTION LAYOUT
Characteristics	machines grouped by function	machines grouped according to the needs of the part or product being manufactured
Appropriate when	a) item volume is low b) flexibility in operations sequence is required	a) high volume makes possible reasonable equipment utilization b) product demand is fairly stable c) products are standardized and parts are interchangeable
Advantages	flexibility in terms of types of products made and production flow	a) reduced processing time b) lower unit costs c) more highly controlled operations
Disadvantages	a) more difficult to route and schedule production b) higher costs c) more difficult cost control	a) higher investment in machinery and higher rate of production required b) little flexibility

PLANT LAYOUT

An accompanying consideration is the actual layout of your production facility. Planning the layout is a major undertaking, requiring time and skill. The results that can be obtained from an improved layout — lower materials handling costs, less travel for materials, more convenient and efficient work places — are sometimes phenomenal.

Your general objective is to permit production to flow with a minimum of bottlenecks. In planning the layout, you ought to consider:

(a) future expansion plans and possibilities;

(b) the required output capacity of the plant (will you build a plant to meet peak demand, or to meet some lower level of demand and stockpile inventory?);

(c) space requirements, including restrooms, office space, storage areas, receiving areas, and of course the manufacturing area itself;

(d) the type of layout —— process or production.

A brief comparision of the two types of Layout is provided in Table C — Plant Layout.

The main differentiating feature is that in a process layout machines are grouped by function, while in a production layout they are grouped according to the needs of the product being manufactured. The production layout is the 'line' type layout. It is entirely possible that in your plant you will have features of both types of layout. However, depending on the features of your own manufacturing procedure, one or the other will be more appropriate.

A graphic representation of the two layouts is provided in Figure 1 and 2.

It might be worthwhile to devise an 'ideal' layout, the layout which will be most effective and efficient. The ideal layout then becomes the standard by which you judge all revisions or additions to the actual layout.

It cannot be overemphasized how important it is to carefully plan the layout of your manufacturing operation. It is a fundamental part of your planning process.

Figure 1 — Process Layout

Product or line layout where equipment is located according to the sequence of fabrication and assembly operations.

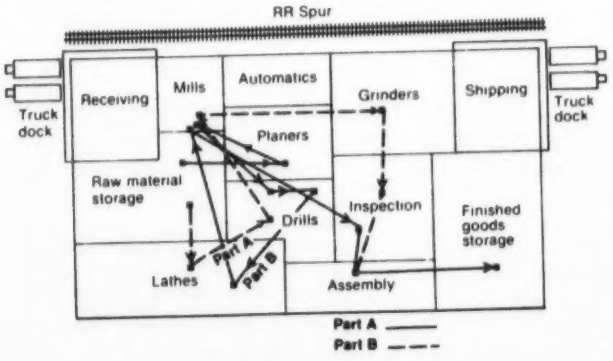
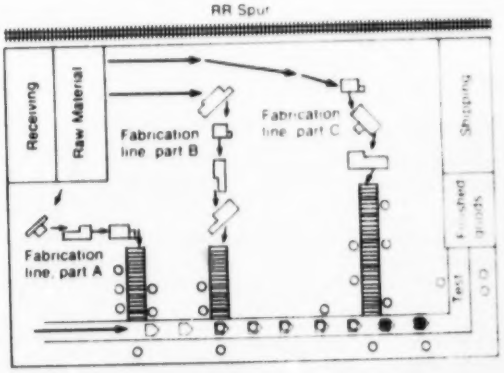


Figure 2 — Production Layout

Process or functional layout with machines arranged in functional groupings.



SCHEDULING

The objective in scheduling is to determine a plan or course of action which optimizes the combination of available capacities from the regular work force, hiring and layoff, overtime, additional shifts, subcontracting, and inventories, and minimizes the affected costs. Production in the plant has to be scheduled to meet demand. Production can be increased by greater use of overtime, hiring more personnel, scheduling more shifts, and subcontracting. It can be decreased by doing the opposite.

In order to schedule properly, one must first have a forecast of the product demand and variable production costs. The demand requirements are the standard or guideline which is used to schedule production levels.

The table below outlines the two basic strategies that might be employed in confronting the scheduling problem. Any plans made, of course, will go awry if demand forecasts do not comply with actual patterns.

The workflow through a process or job shop layout might be best described as a series of waiting lines. The orders wait at each workplace until either men or machines are available for them to be processed. It may be quite difficult to predict how long it will take to deal with any particular order. The essence of scheduling in this situation is to establish the required processes and routings for orders and release them to the shop.

The limiting resource in most job shop situations is labour, not machines. For that reason, it is important that your personnel be able to handle more than one machine in the shop. Such flexibility will enable your shop to complete orders more quickly.

In the job shop situation it is important to establish some sort of system for determining the order in which the jobs will be done at each workplace location. There are a number of rules which might be used:

(1) first come, first served;
(2) shortest operation time, first served;
(3) shortest time until due date;
(4) last in, first served;

Each system has its advantages and disadvantages. Using the shortest operation time (SOT) rule, the average processing time per job is kept quite low. However there is a large variance in the processing times. The shortest time until due date rule may minimize the number of jobs which are not completed on time, but it will increase the average processing time per job.

In a small manufacturing operation the system of scheduling production (men and machines) may not be very sophisticated. However some attempt should be made to link production levels with demand requirements. In that way efficient use can be made of the men and machines in the plant.

Table D
SCHEDULING

Objective	**To meet demand requirements, while keeping associated costs (inventory, labour) to a minimum**	
Options	1. constant level of production, using inventory to absorb demand fluctuations	2. vary production with demand requirements
High Costs	inventory, since in low demand periods production continues and inventory is built up	labour, including subcontracting, overtime, and additional shifts: morale problems may be encountered because of the layoffs
Low Costs	labour, notably in the form of subcontracting and overtime	inventory, since very little is kept on hand

COSTS

The next costs to be estimated are those of direct labour and direct materials, or those costs for materials and labour which go directly into the manufacture of the product. Direct materials include all component parts of a product, as opposed to materials such as office supplies, cleaning supplies and shop tools. A bill of material which summarizes the direct costs for each item manufactured should be prepared. The costs on that bill of material are separated into material costs and labour costs, as in the sample bill of material below. A blank copy of the bill is contained in Worksheet 1 - Cost Estimate Guide Sheet.

(1) **Direct Labour Costs:** such costs include any wages paid for work done directly in manufacturing the product. Typically these processes would include cutting, grinding, welding, assembling, painting, packaging, and so on. On the bill of material, list each operation, the estimated time required to perform the operation, and the wage rate paid. The total direct labour cost for the item can then be calculated.

With regard to labour, there are other factors to consider besides cost. They include:

a) the availability of specialized labour;
b) possible assistance in the form of wage subsidies from Canada Manpower;
c) government regulations regarding minimum wages, hours of work, hiring practices, and so on; and
d) alternative wage payment plans (profit sharing, bonuses for extra production, etc.)

(2) **Direct Material Costs:** the next step is to add direct material costs to the bill of material. You must again attempt to identify the quantity of material that will be used per unit of production, and its accompanying cost. Naming the supplier on the bill of material will force you to actually search for a source of supply, which will provide you with accurate cost information. As well, it will verify the existence of a source of supply.

With regard to materials, other considerations include:

a) identification of alternative sources of supply, in case the primary source is somehow cut off;
b) do materials require any special storage facilities?
c) are delivery and freight costs included in the price of goods?
d) what allowance should be made for waste and other 'shrinkage"?

The information gathered on the bill of material can now be transferred to Items 2 and 3 on the Cost Estimate Guide Sheet. Unit costs are multiplied by the production estimate for the year to obtain the total costs per year.

Figure 3 — Direct Costs

SUGGESTED BILL OF MATERIAL FORMAT

BILL OF MATERIAL								
MATERIAL COSTS					LABOUR COSTS			
Part	Description	Supplier	Landed Costs		Estimated Assembly	Labour Mfg. Est.	Hourly Rate	Labour Costs
			$				$	$
		TOTALS					TOTALS	

(3) **Indirect Costs:** there are many other costs which must be considered in determining the ultimate cost of manufacture. These costs are all those which are not either direct labour or materials —— supplies, utilities, management and clerical salaries, insurance, taxes, depreciation, interest, and so on. The calculation of interest and depreciation, because of its importance, is discussed separately below.

Indirect costs are often separated into categories, such as operating, selling, and administrative. In completing the Cost Estimate Guide Sheet, there are 4 items involved in indirect costs: Item 1 (Selling/Market Costs); Item 4 (Consumable Tools and Shop Supplies); Item 5 (Overhead Expense); and Item 6 (Finance Expense —— as noted above, it is discussed later).

Unlike direct costs, in the short term indirect costs do not vary with the level of production. The unit cost for indirect costs thus depends not only on the costs themselves, but also on the level of production. If total overhead expense is $40,000 and the production level is 10,000 units, the cost/unit is $4.00. However if production is only 8,000, the cost/unit is now $5.00.

Figure 4 — Indirect Costs

SELLING/MARKET COSTS

		Cost Per Year		Unit Costs	
1	Packaging				
2	Brochures				
3	Advertising				
4	Sample Kits				
5	Salesmans Salaries				
6	Commissions/Discounts				
7	Shipping Supplies				
8	Travel Expense				
9	Car Expense				
10	Other Expenses				
Total/Year/Units					

CONSUMABLE TOOLS AND SHOP SUPPLIES

List on Separate Sheet if necessary.

Costs Per Year		Unit Costs	

Total/Year/Units

OVERHEAD EXPENSE

		Costs Per Yer		Unit Costs	
1	Engineering Drawings				
2	Drafting Supplies				
3	Heat Light Power				
4	Maintenance/ Repairs				
5	Owners Salaries				
6	Office Salaries				
7	Office Expense				
8	Auto Payments				
9	Auto Repairs				
10	Truck Payments				
11	Truck Repairs				
12	Freight-In-Out				
13	Telephone				
14	Travel Expense				
15	Bank Service Charge				
16	Legal and Audit				
17	Business Tax				
18	C.P.P.				
19	U.I.C.				
20	Workmans Compensation				
21	Other Expenses				
Total/Year/Units					

Since it is essential to have accurate cost information, it is important to closely monitor overhead cost calculation. If total overhead expense is $25,000 and a new secretary is hired at $10,000 per year, the new overhead cost/unit would be:

at a production level of 10,000 units	$3.50
at a production level of 15,000 units	2.33
at a production level of 5,000 units	7.00

(4) Financing Costs

(a) CAPITAL REQUIREMENTS

Two important elements of overhead costs are interest and depreciation. In order to calculate interest, you first must decide what your capital requirements are. These requirements include:

- costs of plant, equipment and fixtures,
- costs of required raw materials,
- value of initial credit sales,
- finished goods inventory,
- start-up costs (legal advertising, etc.),
- initial cash requirements (for payroll, supplies, etc.).

You will have to borrow any capital required which you are unable to obtain from your own sources (savings, family). Lending institutions look at the equity you are willing to commit as a sign of your confidence in the undertaking. It is not uncommon for lenders to require the owners of a small business to make a substantial investment in the proposed venture (20% — 25%) as a condition of the loan.

Enterprise Manitoba has prepared a handbook, "Small Business Finance Plan", which deals specifically with arranging proper financing for a small enterprise.

Nevertheless, it is appropriate to briefly discuss this subject here since financing is such an important aspect of manufacturing.

Arranging financing for any business can be a difficult task, especially at the outset. The manufacturer often has major problems in that the capital requirements are usually fairly substantial. Again, the cost guide sheet identifies the investment capital required (item 7) and the start up cash requirements.

When starting a manufacturing business, certain cardinal rules of financing should be observed. For example:

(1) minimize fixed capital outlays. Lease equipment instead of purchasing it. Although this policy may appear more expensive over the long run, it means that the business will have more money available for current expenses and purchasing inventory.

(2) plan your financing requirements well ahead. It is important to approach your banker early and to be properly prepared when you go for a loan.

(3) demonstrate to your banker that you have the business well under control. Keep him informed on any significant developments in your business, and provide financial data regularly.

Once you have determined the amount of borrowed funds needed, you can calculate your annual interest payments. There are three factors involved:

1. amount of term loan and amount of line of credit;
2. repayment period for term loan; and
3. interest rates you will be charged.

The following table can be used to calculate the annual payment of your term loan. If you borrowed $50,000 at 14% over 5 years, annual payments would be $50,000 divided by 3.433, or $14,565.

Table E
Constant Payment Table

REPAYMENT PERIOD IN YEARS	INTEREST RATE					
	14%	**16%**	**18%**	**20%**	**22%**	**24%**
5	3.433	3.274	3.127	2.991	2.864	2.745
6	3.889	3.685	3.498	3.326	3.167	3.021
7	4.288	4.039	3.812	3.605	3.416	3.242
8	4.639	4.344	4.078	3.837	3.619	3.421
9	4.946	4.607	4.303	4.031	3.786	3.566
10	5.216	4.833	4.494	4.193	3.923	3.682
15	6.142	5.575	5.092	4.676	4.315	4.001

That payment can be divided into interest and repayment, as follows:

Figure 5
Interest and Repayment

Year	Payment	Interest	Repayment	Balance
0				$50,000
1	$14,565	$7,000*	$7,565	42,435
2	14,565	5,941	8,624	33,811
3	14,565	4,735	9,830	23,981
4	14,565	3,357	11,208	12,773
5	14,565	1,788	12,773	

*14% of the balance at the beginning of the period.

If you have a line of credit with the bank, then the interest you will pay is fairly easily estimated. If the credit line is $14,000, the maximum interest you will pay is $14,000 x the going rate, say 18.75%, or $2,625 per year. These days interest rates on these types of loans are 'floating', or tied to the prime rate.

(b) DEPRECIATION EXPENSE

Depreciation is an expense which approximates the use of your firm's fixed assets such as equipment, machinery, leasehold improvements, vehicles, and so on. Depreciation (also known in tax circles as capital cost allowance) allows for the loss of value of fixed assets and is a cost of doing business.

The most common method of calculating depreciation is the declining balance method, or deducting some fixed percentage of the value of the asset each year over the life of the asset. The appropriate percentage is determined by Revenue Canada, who prescribe rates allowable on various classes or categories of equipment and buildings.

If, for example, you purchase a one-ton truck for $10,000, the depreciation rate allowed is 30%. Depreciation expense would be as follows:

Year 1	30% of $10,000	$3,000
Year 2	30% of ($10,000 — $3,000) or $7,000	= 2,100
Year 3	30% of ($7,000 — $2,100) or $4,900	= 1,470

INVENTORY CONTROL

You should develop an inventory control system which will enable you to meet customer orders while minimizing the costs associated with inventories. There are a number of such costs:

(1) ordering costs: include costs of placing an order, selecting a supplier, preparing the purchase order, receiving the order and placing it in stock, preparing the cheque for payment, and shipping costs.

(2) production costs: includes the costs of setting up and changing over the plant to facilitate production of an item. These costs may be minimal, depending on your particular situation.

(3) handling & storage: these costs include insurance, rent/storage space, and inventory losses through damage, theft, deterioration or obsolescence.

(4) capital cost; having money tied up in inventory represents a cost to you. The capital that is tied up in inventory could be earning returns for you elsewhere. If you have $50,000 in inventory, it is costing you approximately $10,000 per year (based on today's interest rate).

(5) cost of shortages: if you deplete your stock of raw materials, and production must be halted, you will incur costs of idle labour. As well, sales may be foregone as impatient customers go elsewhere.

You will have to determine what level of "buffer stock" you wish to maintain. Buffer stock is the planned extra inventory on hand required to absorb random variations in demand.

To determine the level of buffer stock, you will have to estimate the maximum usage rates of the inventory during the time it takes for the order to arrive (the lead time). You also have to decide upon the risk level (for running out of stock) that you are willing to accept. If you want to be 100% certain that you will not exhaust your inventory of finished goods, then you will maintain a very high buffer stock.

You should attempt to establish some sort of inventory control system in order to maintain proper inventory levels. That system need not be excessively complicated. Store materials in bins or areas which will hold a given number of units Maintain inventory records, often simply a card (see figure 6), which details the item (and description), the number of items on hand at a certain date, and any items received or withdrawn after that point. Once a reorder point has been established, that too can be added to the card.

You can reorder materials on a fixed order quantity basis or on a cycle basis. For the fixed quantity system, orders are placed when inventory levels reach a predetermined reorder point. The reorder level is set based on average usage, so that the order will be received before the item is depleted. The order is always for the same (fixed) amount. This system is used when perpetual inventory records are kept or with low value items, where the inventory level is under rather continuous surveillance.

In a fixed reorder cycle system, orders are placed weekly, monthly or in some other regular pattern. The size of the order is varied to absorb fluctuations in usage. This system is used more with high value items, or when a large number of items are regularly ordered from the same supplier.

Figure 6
Inventory Card

Item:			
Description:			
Items on hand:		**Date:**	
Counted by:			
Received after count		**Issued after Count**	
Invoice	**Quantiy**	**Requisition**	**Quantity**

MAKE OR BUY COMPONENTS

Most small manufacturers buy a variety of parts from outside suppliers for use in assembling their finished product. Often the manufacturer could make a part in his own plant instead of buying it from an outside source. An important question to be answered is whether the manufacturer can produce the part at a lesser cost than the purchase price from his supplier.

The manufacturer can determine his own cost per unit, and whether it is less than his suppliers' price. He must also decide if any cost saving is enough to justify putting more funds into special equipment or if these funds could be invested to better advantage elsewhere.

DETERMINING PRICE

A discussion of price is contained in "Marketing", another volume in this Enterprise Manitoba series. One consideration in setting price is the competition —— but you should, of course, compare product characteristics as well.

The other part of your pricing decision is the simple fact that you must be sure to have identified all product costs. Although this may sound very obvious, many businesses fail or have poor financial results as a direct result of omitted costs. It is also imperative to a business to identify products which are losing money.

If you have properly completed the cost estimate guide sheet, you will have identified product costs.

It is very important to realize, however, that this total cost figure is likely to underestimate the true total direct cost figure. The reason for this is that other intangible areas such as machine set-up, idle time and coffee breaks have real cost implications. If these factors have not been considered, then a miscellaneous element must be added to the costing calculation before determining price.

An example of calculating true total cost per unit is as follows:

Direct labour per unit	**$2.40**
Materials per unit	**.80**
Overhead per unit	**.20**
Miscellaneous per unit	**.10**
Total Unit Cost	**$3.50**

Arriving at a figure for the miscellaneous safety factor may be difficult. It can best be arrived at by yourself since each factory runs at a different level of efficiency.

You can now determine a price for your product, knowing how much you must charge per unit of output in order to recover direct labour, direct material, overhead, a safety factor for miscellaneous unpredictable costs, and sufficient profit to provide you a reasonable rate of return on your investment.

Profitability

If you have been completing the various steps for your own Business Plan as the method has unfolded, you will have done a lot of work and you will also have a more intimate knowledge of your venture.

In this section, the following important questions will be answered:

1. Is my venture going to be profitable? (Is my Net Profit after Tax positive?)
2. What will my cash flow be like during the first year?
3. At what point during the first year can I expect the tightest cash flow period?

BREAK-EVEN ANALYSIS

An elementary break-even analysis will assist you to identify the sales volume at which costs and revenues are equal. At any volume below that point, you will be losing money, while at volumes above you will be turning a profit.

To determine the break-even point, you first have to differentiate between fixed costs (costs that do not vary with the level of output, e.g. rent, interest, administration expenses) and variable costs (costs that vary directly with the level of output, e.g. direct labour and materials.) All costs are, of course, variable in the long run —— you can close down the plant entirely and incur no costs (except if you still owe banks money).
As an example, let us suppose:

Figure 7 — Break-even Calculation

Fixed costs = $50,000 per year
Selling price = $ 10.00 per unit
Variable costs = $ 7.50 per unit

$$\textbf{Break-even point} = \frac{\text{Fixed Costs}}{\text{Selling Price less Variable Costs}}$$

$$= \frac{\$50{,}000}{\$10.00 - \$7.50} = 20{,}000 \text{ units}$$

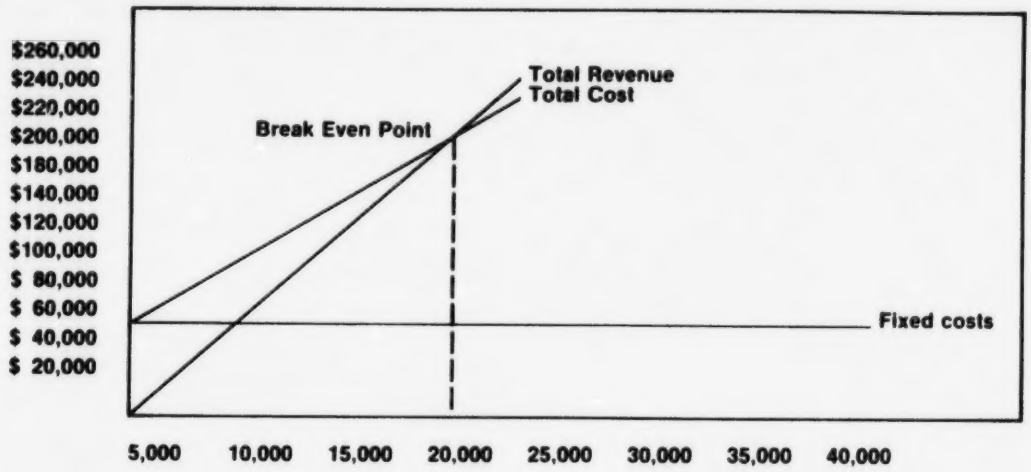
Selling less than 20,000 units will result in a loss for your business, and obviously, therefore, before too long annual sales will have to rise above that figure. To demonstrate:

Figure 8 — Profit/Loss Projection

Sales	(Units)	10,000	20,000	25,000
Revenue	($10.00 per unit)	$100,000	$200,000	$250,000
Variable Cost	($ 7.50 per unit)	75,000	150,000	187,500
Gross Profit		$ 25,000	$ 50,000	$ 62,500
Fixed Cost		50,000	50,000	50,000
Net Profit (loss)		$(25,000)	0	$ 12,500

The validity of your analysis will rest largely on the accuracy of the figures that you use — the cost classifications, the cost estimates and the volume estimates. Errors could cause mistakes in computations, and therefore erroneous decisions could result. Great care must be taken in compiling the data, and it should be continually reviewed for changes.

Figure 9
Break-Even Point



This is a graphic representation of Break-Even Point. It shows that if production is less than 20,000 units, Total Costs exceed Total Revenue. At 20,000, the Total Costs = Total Revenue. At any production level beyond 20,000. Total Revenue exceeds Total Cost.

INCOME PROJECTIONS

At this stage, it might be wise to review all your calculations to date to make sure that there are no errors.
Now, transfer the numbers you have obtained to worksheet 2 — Projected income Statement at the back of the booklet.

(a) enter Sales figures for the next year
(b) calculate the Cost of Goods Sold:
    (i) Add the value of the Opening inventory and the Purchases
    (ii) subtract from that figure the value of the closing Inventory
(c) subtract Costs of Goods Sold from Sales to obtain Gross Income
(d) enter the operating expenses for the year
(e) total the expenses, and subtract that total from Gross Income to obtain Net Operating Income
(f) estimate Income Taxes
(g) subtract Provision for Income Taxes from Net Operating Income to obtain Net Income

CASH FLOW

A cash flow projection is a forecast of the receipts and disbursements you will experience in the first year of operation. This projection focuses on your bank account. It is not uncommon for a small business to be earning a decent profit yet be struggling for survival because of a cash shortage.

This cash flow projection is a technique that can be used as an early warning system to indicate a potential problem before it becomes a crisis. Should your cash flow projection forecast such a situation, you can either go out and secure the necessary resources to deal with the problem or adjust your practices to improve the situation.

To chart your cash flow position in each month of your first year, set up a system for recording your cash receipts and disbursements (see Worksheet 3). Using this form, you will be able to pinpoint the times during the year when cash will be tight. You have already gathered the information necessary to complete this cash flow projection.

The distribution of the sales total to each month of the year and to the cash and credit options will be made easier by the answers to the following questions:

1. How are sales distributed over the seasons and months of the year?
2. What percentage of your annual sales are cash, credit card or receivable?

Other Considerations

(1) Regulations;

There may be regulations which are pertinent to your operations (ex. The Clean Air Act). Identify these standards or regulations before proceeding with your planning.

(2) Location:

There are a number of factors to consider in choosing a location for your plant. They include: proximity to raw materials, labour availability, climate, transportation facilities, proximity to markets, community features and facilities, municipal by-laws and the physical land sites. Your choice will probably be limited to the community or area in Manitoba in which you wish to locate.

(3) Personnel:

Your employees could be your business' most valuable asset. You might consider developing job descriptions to be used for selecting, training and paying employees. In determining wage levels, include considerations of minimum wages, union scales, salaries for other similar jobs in the area, and the prior salaries of the applicant. You should attempt to deal with all personnel problems quickly, directly, and in a non-partisan manner. See the Enterprise Manitoba publication 'Human Resource Management' for a more extensive discussion of these topics.

(4) Business Records:

A good set of records will provide information which management can use in directing the operation of the business. The system which provides the information should be easy to understand, flexible, simple and efficient to operate. It should produce cost data showing the results of past operations, as well as comparisions with prior periods and budgeted figures.

The business records should include records of:

- sales and accounts receivable
- purchases and accounts payable
- cash receipts and disbursements
- inventory
- equipment and depreciation
- petty cash and bank deposits
- payroll

(5) Buy, Lease or Build?

Depending on your own particular situation, you may have the option of either building, leasing/renting or buying your plant facility. As a result of today's increasing land and building costs, many businesses are looking very closely at the renting/leasing option. If you decide to lease, have a lawyer review the lease before you sign. Specific points to look for include:

- provision for renewal/subletting;
- whether or not the removal or installation of equipment and fixtures will be allowed;
- which party is responsible for repairs, alterations, payment of utilities, and insurance;
- whether the premises are properly zoned.

Conclusion

At this point, if you have followed the steps recommended on the preceding pages, you will know or at least better appreciate the following;

- The likelihood of attaining your "Break-Even Sales" level and, therefore, the dollar value of the risk you will be taking.
- The cash flow implications of getting into this kind of business.
- The chances of being able to "sell" other investors or financial institutions on backing your plan.

If your Business Plan now says, "Go Ahead!", you should tidy it up, have it typed if possible, make a few copies and put them in attractive binders or folders (available from office supply stores) and set out to call on those whose help you need to launch your business. Your Business Plan should include the Assessment of Personal Finances, Projected Income Statements, Projected Cash-Flow Statements, and brief descriptions of the product, the business, and the market. This approach is also suited to the situation where you are seeking support for expansion, re-financing, increased inventories, etc.

If, on the other hand, your Business Plan says, "Hold It!", don't give up immediately. Be thankful you have been warned of possible disaster. Then, go back over the whole Plan and the idea it supports. Can you make changes or adjustments, cut back on something, be a little less ambitious for the early years? It is unusual if a Business Plan comes out perfectly the first time around.

IN CLOSING

This, and other Business Plan formats, with examples and explanations, has been published by the Enterprise Development Centre to help and encourage Manitobans who wish to embark on business ventures in the manufacturing, retail, service and construction fields. If you would like to discuss your Business Plan or have problems and questions related to its preparation, feel free to call your nearest Centre to arrange a meeting with one of the counsellors.

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Worksheet 1

COST ESTIMATE GUIDE SHEET

The Cost Estimate Guide Sheet (following) can be used to obtain an appraisal of your costs of manufacture. The Guide Sheet has been referenced at various points throughout the Business Plan, and if you followed the directions, you should have been able to complete the Guide. To properly complete the Guide, you will have to know what your production level will be.

The first page of the Guide Sheet summarizes some of the key elements of your marketing plans, simply to insure that they have been given consideration.

To briefly summarize the cost estimation process:

(1) complete the Bill of Material on page 27. This will identify the direct costs of manufacture.
(2) transfer that information to Items 2 and 3 on page 24. To obtain a total for each item, you will need to know the total number of units to be produced for the year.
(3) complete Items 7, 8, and 9 on pages 25 and 26.
(4) complete Items 1, 4, and 5 on page 24
(5) transfer the information from pages 24 and 25 to the summary of total costs on page 26.
(6) identify the start-up cash requirements (page 26) —— operating expenses, opening inventory, and the cash down-payment on investment capital.
(7) having identified the total initial cash outlay required (page 26), now identify the sources of cash funds to cover that requirement.
(8) having identified the initial cash requirements, you can now calculate the initial finance expense (page 24).
(9) fill in the finance expense on the cost summary, page 26.

The necessity of having an accurate cost estimate has been discussed earlier in the handbook. You should, of course, monitor the actual costs once your operation has started and compare them to your projections. Any deviations should be incorporated into any subsequent projections.

The cash flow projection (page 29) can be used to more specifically identify the predicted inflows and outflows of cash. The forecast should enable you to become aware of possible shortfalls of cash before they actually occur, so that you can make arrangements to cover any such shortfall. If the forecast is compiled carefully, you should not be surprised by sudden cash surpluses, which you can put to use by expanding the plant, or investing in some other form.

Date _____

Name _____ **Address** _____

_____ **Tel.** _____

Type of Manufacturing Proposed _____

_____

Location of Manufacturing Plant **Address** _____

_____

Product Lines under consideration

Product A) _____ Estimated Market $ _____ Units/Year _____

B) _____ Estimated Market $ _____ Units/Year _____

C) _____ Estimated Market $ _____ Units/Year _____

Expected Sales (where products will be sold — geographically)

A) Local (under 40 miles)	Retail _____	Commercial _____	Industrial _____
B) Rural (over 40 miles)	Retail _____	Commercial _____	Industrial _____
C) Winnipeg	Retail _____	Commercial _____	Industrial _____
D) Outside Province	Retail _____	Commercial _____	Industrial _____

Comments on Sales Market _____

_____

Potential Trading Market (by Population or Business Outlets)

	Retail	Commercial	Industrial
A) Local			
B) Rural			
C) Winnipeg			
D) Other			

List Potential Distributors or Sales Outlets if known

_____ D) _____

B) _____ E) _____

C) _____ F) _____

Item 1.
SELLING/MARKET COSTS

		Costs Per Year		Unit Costs	
1-1	Packaging				
1-2	Brochures				
1-3	Advertising				
1-4	Sample Kits				
1-5	Salesmen's Salaries				
1-6	Commissions/Discounts				
1-7	Shipping Supplies				
1-8	Travel Expense				
1-9	Car Expense				
1-10	Other Expenses				
Total/Year/Units					

Item *2
MANUFACTURING COSTS
From Bill of Material
(see page 27)

2-1	Raw Materials			
2-2	Component Parts			
	(Attach list of Bill of Materials)			
Total/Year/Units				

Item 3.
DIRECT PLANT LABOUR

3-1	Totals from Bill of Materials			
Total/Year/Units				

Item 4.
CONSUMABLE TOOLS AND SHOP SUPPLIES

List on Separate Sheet				

Item 5.
OVERHEAD EXPENSE

		Costs Per Year		Unit Costs	
5-1	Engineering Drawings				
5-2	Drafting Supplies				
5-3	Heat Light Power				
5-4	Maintenance/ Repairs				
5-5	Owners Salaries				
5-6	Office Salaries				
5-7	Office Expense				
5-8	Auto Payments				
5-9	Auto Repairs				
5-10	Truck Payments				
5-11	Truck Repairs				
5-12	Freight-In-Out				
5-13	Telephone				
5-14	Travel Expense				
5-15	Bank Service Charge				
5-16	Legal and Audit				
5-17	Business Tax				
5-18	C.P.P.				
5-19	U.I.C.				
5-20	Workmans Compensation				
5-21	Other Expenses				
Total/Year/Units					

Item 6.
FINANCE EXPENSE

6-1	Mortgage Payments			
6-2	Equipment Loans			
6-3	Bank Loans			
6-4	Other			
Total/Year/Units				

Item 7.

INVESTMENT CAPITAL REQUIRED

		Initial Costs		Cash Required		Balance		Comments: Terms: Name of Finance Co.: Etc.:
7-1	Land Size (x)							
7-2	Building Size (x)							
*7-3	Improvements A Mechanical and Electrical							
*7-31	Improvements B. Construction							
*7-4	Machinery and Equipment							
*7-5	Shop Tools							
*7-51	Consumable Tools							
7-6	Trucks							
7-7	Car							
7-8	Office Equipment							
7-81	Desks							
7-82	Chairs							
7-83	File Cabinets							
7-84	Adding Machine							
7-85	General Supplies							
	TOTALS							

Item 8

START UP INVENTORY

Estimated from Bill of Material

		Product A.	Product B	Product C	Comments: Suppliers and Location:
8-1	Raw Materials				
8-2	Component Parts				
8-3	Other				

***NOTE:** *Make up a separate Bill of Material for each product that is to be manufactured.*

Item 9

LABOUR REQUIREMENTS (List All Proposed Staff)

Item	Type of Labour	Hourly Rates	Yearly Rates	Part Time	Comments on Skill Availability:
9-1					
9-2					
9-3					

SUMMARIZE TOTAL COSTS FROM PREVIOUS PAGES:

Item	Cost/Year		Unit Costs	
1. Selling/Market				
2 Manufacturing				
3. Direct Labour				
4. Consumable Tools				
5. Overhead Expense				
6. Finance Expense				
Total/Year/Unit				
Add Gross Profits				
Estimated Sales/Year				

START UP CASH REQUIREMENTS

(A)	Consider Two Months Operating Expense	
(B)	Opening Inventory	
(C)	Cash Downpayment on Investment Capital See Item 7.	
	TOTAL INITIAL CASH OUTLAY REQUIRED	

PROPOSED SOURCES OF CASH FUNDS FOR START UP

(A)	Personal Funds	
(B)	Mortgages	
(C)	Bank Loans	
(D)	Leasing-Equipment	
(E)	Other Sources	
	Total	

MEMO — The following control systems should be initially considered:

Plant Work Orders; Bill of Materials; Labour Time Sheets; Inventory Controls; Shipping Forms; Sales Invoices; Purchase Orders; Petty Cash Vouchers; Office File Systems; Sales Literature; Customer Statements; Accounting Systems as recommended by Accounting Firm; Monthly Cash Flow Sheets; Accounts Receivable and Accounts Payable Control Sheets.

SUGGESTED BILL OF MATERIAL FORMAT

BILL OF MATERIAL								
MATERIAL COSTS					LABOUR COSTS			
Part	Description	Supplier	Landed Costs		Estimated Assembly	Labour Mfg. Est.	Hourly Rate	Labour Costs
			$				$	$
		TOTALS					TOTALS	

Worksheet 2

PROJECTED INCOME STATEMENT

Gross Sales		_____
Cash Discounts		_____
Net Sales		
Less Cost of goods sold:		
Beginning inventory	_____	
Plus net purchases	_____	
Total	_____	
Less Ending inventory	_____	
Cost of goods sold	_____	_____
Gross Income		
Less Operating expenses:		
Bank charges and interest	_____	
Owner's salary	_____	
Employees' wages	_____	
Rent	_____	
Utilities (heat, light, water, power)	_____	
Supplies	_____	
Repairs and maintenance	_____	
Advertising	_____	
Delivery expense	_____	
Taxes and licences	_____	
Depreciation	_____	
Bad debts	_____	
Miscellaneous expenses	_____	
Total operating expenses		
Net operating income		_____
Income tax (estimated)		_____
Net income after income taxes		_____

Worksheet 3

CASH FLOW PROJECTION

		Month 1	Month 2	Mont
Receipts	Cash Sales			
	Collections on Account			
	Other Income			
	Total Receipts			
Disbursements	Purchases			
	Owner's Drawings			
	Payroll — Gross			
	Rent			
	Repairs & Maintenance			
	Business Tax			
	Advertising			
	Automobile			
	Delivery			
	Dues & Licenses			
	Insurance			
	Interest			
	Legal & Audit			
	Supplies			
	Business Travel			
	Utilities			
	Depreciation			
	Other			
	Total Disbursements			
Cash from Operations				
Cash Total — Start of Period				
	Total Cash — Surplus (Deficit)			
Other Payments	Asset Purchase			
	Equity Withdrawals			
	Loan Repayments			
	Total Other Payments			
	Total Cash — Surplus (Deficit)			
Other Receipts	Equity Increase			
	Loan Proceeds			
	Sales of Assets			
	Total Other Receipts			
	Cash Total — End of Period			

3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Total